

Abstract

## USE OF PHOTONIC BAND GAP STRUCTURES IN OPTICAL AMPLIFIERS

5 An optical amplifier uses a photonic band gap structure having a doped core defining at least a first wavelength range over which stimulated emission can occur after excitation caused by the introduction of pump light. The photonic band gap structure is designed to permit light  
10 having energy corresponding to the wavelength range to be transmitted only in selected directions, including along the photonic band gap structure. The propagation down the structure is one of a discrete number of possible transmission directions for the photons resulting from  
15 stimulated emission. This improves the pump efficiency, as the stimulated emissions are concentrated into the direction of propagation down the fiber.

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